

APPARATUS AND METHODS FOR WRAPPING TEXTURE ONTO THE SURFACE OF A VIRTUAL OBJECT

Abstract

5 The invention provides techniques for wrapping a two-dimensional texture
conformally onto a surface of a three dimensional virtual object within an arbitrarily-
shaped, user-defined region. The techniques provide minimum distortion and allow
interactive manipulation of the mapped texture. The techniques feature an energy
minimization scheme in which distances between points on the surface of the three-
10 dimensional virtual object serve as set lengths for springs connecting points of a planar
mesh. The planar mesh is adjusted to minimize spring energy, and then used to define a
patch upon which a two-dimensional texture is superimposed. Points on the surface of
the virtual object are then mapped to corresponding points of the texture. The invention
also features a haptic/graphical user interface element that allows a user to interactively
15 and intuitively adjust texture mapped within the arbitrary, user-defined region.

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